

## Claims

1. A distribution network for distributing a clock signal comprising a sequence of counter signals, the network comprising:

- a plurality of delivery points for facilitating simultaneous detection of different counter signals to provide timing information,

wherein the clock signal comprises a modulated carrier, whereby the sequence of counter signals is in the form of an envelope of the carrier.

2. A distribution network as claimed in claim 1, wherein path length differences between the delivery points with reference to any point along a common propagation path of the clock signal towards the delivery points are chosen to be equal to or a multiple of a spatial pitch of the sequence of counter signals.

3. A network as claimed in claim 1, arranged as a star, ring or mesh network.

4. A network as claimed in claim 1, wherein the clock signal distribution network comprises a resonant structure.

5. A network as claimed in claim 4, wherein a clock signal from an external clock source is coupled into the resonant structure.

6. A network as claimed in claim 4, wherein the resonant structure is arranged to generate and maintain the clock signal.

7. A network as claimed in claim 4, wherein one or more resonant structures are coupled via nodes on the respective resonant structures.

8. A network as claimed in claim 4, wherein the resonant structure comprises a ring.

9. A network as claimed in claim 1, wherein the network comprises a plurality of intersecting sub-networks.

10. A network as claimed in claim 1, wherein the clock signal comprises an amplitude modulated carrier, a phase modulated carrier, a frequency modulated carrier, and/or a beat signal of two or more signals having different frequencies.

11. A network as claimed in claim 1, wherein the clock signal comprises an optical clock signal.

12. A network as claimed in claim 1, wherein the clock signal comprises a signal multiplexed into a plurality of channels, whereby the multiplexed clock signal comprises two or  
5 more sequences of counter signals in different channels of the multiplexed clock signal.

13. A network as claimed in claim 12, wherein the sequences of counter signals have different spatial pitches, and the network comprises different groups of delivery points for facilitating detection of the counter signals from respective sequences, wherein for each group of delivery points at least two different counter signals of one of the sequences are detectable  
10 simultaneously at different delivery points of said group.

14. A network as claimed in claim 12, wherein the sequences of counter signals have the same spatial pitch with different delays between the sequences in the respective channels, and the network comprises different groups of delivery points wherein optical path length differences between delivery points of different groups with reference to any point along a  
15 common path of the clock signal towards the delivery points are chosen to be equal to or a multiple of the delay, whereby counter signals in different channels of the multiplexed signal are simultaneously detectable at the delivery points of different groups.

15. A network as claimed in claim 12, wherein the clock signal comprises a multiplexed optical signal.

20 16. A network as claimed in claim 15, wherein the multiplexed optical signal comprises one or more of a group comprising a WDM signal, a TDM signal and a CDMA signal.

17. A distribution network for distributing a clock signal comprising:

- a bi-directional common propagation path for the clock signal;
- 25 - a plurality of delivery points in the common propagation path for facilitating detection of counter signals to provide timing information,
- two clock signal portions in the common path counter propagating at the same propagation speed, whereby a standing wave clock signal exists in the common path, and

wherein each clock signal portion comprises a modulated carrier signal, whereby a sequence of counter signals is simultaneously detectable at the delivery points as changes in an envelope of the standing wave clock signal.

5           18.    A network as claimed in claim 17 wherein the clock signal comprises an amplitude modulated carrier, a phase modulated carrier, a frequency modulated carrier, and/or a beat signal of two or more signals having different frequencies.

          19.    A network as claimed in claim 17, wherein the clock signal comprises an optical clock signal.

10           20.    A method of distributing a clock signal comprising a sequence of counter signals, the method comprising the steps of:

- providing the clock signal in the form of a modulated carrier, whereby the sequence of counter signals is in the form of an envelope of the carrier, and

15           - simultaneously detecting different counter signals at a plurality of delivery points to provide timing information.

          21.    A method of distributing a clock signal comprising the steps of:

- counter propagating two clock signal portions in a common path at the same propagation speed, whereby a standing wave clock signal exists in the common path, wherein each clock signal portion comprises a modulated carrier, and

20           - detecting a sequence of counter signals simultaneously at different delivery points in the common path as changes in an envelope of the standing wave clock signal.